

**Translation**

**PATENT COOPERATION TREATY**

PCT/EP2003/010328



**PCT**

**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 55239	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP2003/010328	International filing date (day/month/year) 17 September 2003 (17.09.2003)	Priority date (day/month/year) 30 September 2002 (30.09.2002)
International Patent Classification (IPC) or national classification and IPC G01C 19/72		
Applicant LITEF GMBH		

<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>6</u> sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of _____ sheets.</p>
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>

Date of submission of the demand 26 March 2004 (26.03.2004)	Date of completion of this report 03 August 2004 (03.08.2004)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP2003/010328

## I. Basis of the report

## 1. With regard to the elements of the international application:\*

- ☐ the international application as originally filed
- ☒ the description:  
pages \_\_\_\_\_ 1-4 \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the claims:  
pages \_\_\_\_\_ 1-3 \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, as amended (together with any statement under Article 19  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the drawings:  
pages \_\_\_\_\_ 1/2-2/2 \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

## 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

## 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP 03/10328

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Claims	1-3	YES
	Claims		NO
Inventive step (IS)	Claims	1-3	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-3	YES
	Claims		NO

### 2. Citations and explanations

#### 1. Technical field:

The invention relates to a method and a multifunctional integrated optical chip (MIOC) for regulating the operating frequency of a fiber optic gyroscope.

#### 2. Independent claims: claims 1 (method) and 2 (device)

#### 3. Prior art:

This report makes reference to the following documents:

D1: DE-A-101 30 159; LITEF GMBH; 16 January 2003

D2: DE-C-197 53 427; LITEF GMBH; 4 February 1999

D1, which is regarded as the closest prior art, discloses a method for preventing bias errors of a fiber optic gyroscope with a closed control loop by superimposing an auxiliary modulation signal on the detector output signal.

D2 describes a method and a device for increasing the accuracy (resolution) of a digital phase modulator by analog conversion of a binary control signal and applying this signal to separate phase correction

electrodes provided in the MIOC.

**4. Novelty (PCT Article 33(2))**

**4.1 Independent claims 1 and 22:**

The subject matter of independent claims 1 and 2 differs from the closest prior art according to D1 in that an auxiliary modulation signal is superimposed on the detector output signal in order to regulate the operational frequency of the fiber optic gyroscope and in that this auxiliary modulation signal is applied to separate phase correction electrodes provided in the MIOC. The subject matter of claims 1 and 2 is therefore novel over D1.

**5. Inventive step (PCT Article 33(3))**

**5.1 Independent claims 1 and 2:**

This method and this system solve the objective technical problem of simplifying the method for regulating the operational frequency of a fiber optic gyroscope. Although D2 describes the application of an analog control signal for the phase modulator to separate phase correction electrodes provided in the MIOC, this is done for an entirely different purpose, namely for increasing the resolution. A person skilled in the art therefore does not have any reason to combine D1 and D2, and even if this person did combine these documents, this would not lead to the method proposed in the present application because, in D2, a control signal, but no auxiliary modulation signal, is applied to the phase correction electrodes. A method of this type and a device of this type are therefore neither known nor obvious

from the cited prior art. The requirements of PCT Article 33(3) are therefore met.

**5.2 Dependent claim 3:**

Dependent claim 3 relates to additional features of independent claim 2, to which it refers, and for this reason is also regarded as novel and inventive.

**6. Industrial applicability (PCT Article 33(4))**

The invention claimed in claims 1 to 3 is industrially applicable in the field of fiber optic gyroscopes.